Richmond Refinery LPS Reliability Alert

RLOP F-1550 Furnace Elbow Leak and Fire

IMPACT Loss ID:
23111

Location: Hydro Division, RLOP, HNC Plant

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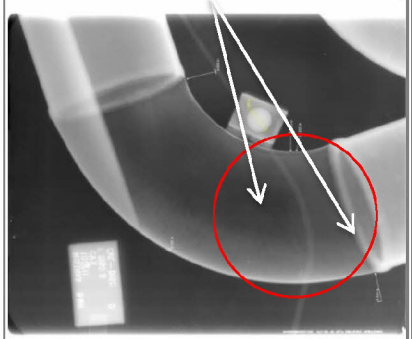
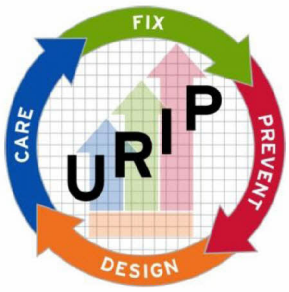
Leaking elbow after operations cleanup and pop-and-purge.



Carbon steel elbow in 5Cr Furnace Coil



IIF -- Every Task, The Right Way, Every Time

Incident Description:

On Monday 10/03/2011 at 2:53am, the RLOP Heavy Neutral Cracker (HNC) F-1550 Vacuum Column Feed Furnace developed a furnace tube leak about two hours after pulling feed since 12:30am as part of the scheduled plant turnaround. Operators invoked their Stop Work Authority by immediately blocking fuel to burners, and isolated the leak by aborting the furnace diesel flush and reactor hot strip.

After establishing safe and controlled conditions, Operations drained and cleaned the furnace for inspection of the suspected leak area. Radiography revealed the 5" bottom elbow at Pass-D had corroded. A PMI (Positive Material Identification) exam determined this corroded elbow was made of carbon steel rather than the required 5-Cr alloy.

An investigation is in progress.

Background:

1. The PMI process did not exist when the F-1550 was built in 1984.
2. In the past 10 years, sulfur concentrations and furnace outlet temperatures have not changed significantly.
3. Current PMI practices can prevent this failure scenario.

Immediate Actions Taken:

1. CFD responded immediately. All required notifications were made.
2. Operations, Maintenance, and Technical personnel collected the data that was available prior to entry and inspections to understand possible failure scenarios and develop repair options.
3. DED ordered the correct 5-Cr elbows to prevent any repair delays.
4. Began 100% PMI inspection of the entire F-1550 furnace coil.
5. Reviewing QC data for furnaces that are similar to the HNC F-1550.

IIF – Recognize Risk

Loss Prevention Self-Assessment

BEFORE BEGINNING ANY ACTIVITY/TASK/JOB, AFTER A LOSS OR NEAR LOSS, ANY UNUSUAL CIRCUMSTANCES:

ASSESS the risk!
What could go wrong?
What is the worst thing that could happen if something does go wrong?

ANALYZE how to reduce the risk!
Do I have all the necessary Training and Knowledge to do this job properly?
Do I have all the proper Tools and Personal Protective Equipment?

ACT to ensure loss-free operations!
Take necessary Action to ensure the job is done properly!
Follow written procedures! Ask for assistance, if needed!

DO NOT PROCEED UNLESS ALL RISKS HAVE BEEN ADDRESSED!

For Everyone • Every Day • All the Time